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Claims

1. A nucleic acid sequence selected from:
 - a) a sequence of nucleotides consisting of from nucleotide 100 to nucleotide 649 of the genome of a group 1 coronavirus, said nucleotide sequence including the encapsidation sequence of said coronavirus;
 - b) a nucleic acid sequence analogous to the sequence defined in a) that contains the encapsidation sequence of a group 1 coronavirus;
 - c) a nucleic acid sequence complementary to either of said sequences a) or b), and

d) a nucleic acid sequence with a secondary structure similar to that of an encapsidation sequence (ES) of a group 1 coronavirus, independent of the primary nucleotide sequence.

2. Sequence according to Claim 1, wherein said nucleic acid is any molecule of DNA or RNA.

3. Sequence according to Claim 1, wherein said group 1 coronavirus is selected from the group made up of porcine, canine, feline, and human coronaviruses.

4. Sequence according to Claim 1, made up of the nucleotide sequence shown in SEQ. ID. No.: 1, or by a fragment thereof, which contains the encapsidation sequence of the porcine transmissible gastroenteritis virus (TGEV).

5. A nucleic acid construct that includes a nucleic acid sequence according to any of Claims 1-4, together with, optionally, a transcription promoter sequence.

6. A plasmid that contains said nucleic acid sequence according to any of Claims 1-4, or said nucleic acid construct according to Claim 5.

7. A vector that includes

a nucleic acid sequence (I) selected from (i) a nucleic acid sequence corresponding to the complete genome, or a part thereof, of a group 1 coronavirus, and (ii) a nucleic acid sequence of another virus that has a sequence identity equal to or greater than 60% with said sequence (i); from which at least one gene essential to assembly of said virus has been deleted; and

a nucleic acid sequence according to any of Claims 1-4.

8. Vector according to Claim 7, wherein said nucleic acid sequence according to any of Claims 1-4 has been inserted in a position of the nucleic acid sequence (I) other than its original position in the wild viral genome, or in a position adjacent to or immediately to the side of the deleted gene, or one of the deleted genes, in said nucleic acid sequence (I).

9. Vector according to Claim 7, wherein said nucleic acid sequence (I) is the complete genome sequence of a group 1 coronavirus, or a fragment thereof, from which at least one gene essential to the assembly of said coronavirus has been deleted, and in which said nucleic acid sequence according to any of Claims 1-4 has been located in a position other than its original position in the wild coronavirus.

10. Vector according to Claim 9, wherein said nucleic acid sequence (I) is the sequence of the complete genome of a group 1 coronavirus, or a fragment thereof, from which at least one gene essential to the assembly of said coronavirus has been deleted, and in which said nucleic acid sequence according to any of Claims 1-4 has been located in a position adjacent to or immediately to the side of the deleted gene or one of the deleted genes.

11. Vector according to any of Claims 7-10, which also includes a heterologous nucleic acid sequence which codes for a determined activity, under control of the transcription regulatory elements present in said vector.

12. Method for producing a product of interest that includes cultivating a host cell that contains a vector according to Claim 11 under conditions that permit the expression of the heterologous nucleic acid and recovery of the product of interest.

13. A method for producing a recombinant coronavirus that includes introducing a viral vector according to any of Claims 7-11 into a host cell, cultivating said host cell that contains said vector under conditions that permit the expression and replication of the vector and recovering the virions obtained from the recombinant coronavirus.

14. A host cell that includes a vector according to any of Claims 7-11.

15. A vaccine capable of protecting an animal against infection caused by an infectious agent that includes (i) at least one vector according to Claim 11, which expresses at least one antigen capable of inducing an immune response to said infectious agent, or an antibody that provides protection against said infectious agent, together with, optionally (ii) a pharmaceutically acceptable inactive ingredient.

16. Vaccine according to Claim 15, wherein said vector expresses at least one antigen capable of inducing a systemic immune response and/or an immune response in mucosa to different infectious agents that propagate in the respiratory or enteric mucosa.

17. A multivalent vaccine capable of protecting an animal against infection caused by more than one infectious agent including (i) a vector according to Claim 11, which expresses antigens capable of inducing an immune response to said infectious agents, or antibodies that provide protection against said infectious agents, together with, optionally (ii) a pharmaceutically acceptable inactive ingredient.

18. Multivalent vaccine capable of protecting an animal against infection caused by more than one infectious agent, including (i) more than one vector according to Claim 11, each of which express an antigen capable of inducing an immune response to each one of said infectious agents, or antibodies that provide protection against each one of said infectious agents, together with, optionally, (ii) a pharmaceutically acceptable inactive ingredient.

Summary

NUCLEIC ACID SEQUENCE THAT INCLUDES THE RNA ENCAPSIDATION SIGNAL OF A GROUP 1 CORONAVIRUS AND ITS APPLICATIONS

The nucleic acid sequence includes the RNA encapsidation signal of a group 1 coronavirus such as porcine transmissible gastroenteritis virus (TGEV) situated between nucleotides 100 and 649 of the genome of said coronavirus. This sequence may be used to